



NUCLEAR ENERGY INSTITUTE

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Mr. James E. Lyons  
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Dear Mr. Lyons:

We appreciated the opportunity to provide input to the NRC staff on matters related to modular plant licensing during a March 27, 2002, NRC workshop and a May 22 public meeting. We understand that the staff is considering stakeholder inputs as it prepares to provide recommendations in this area to the Commission via an update to SECY-01-0207. The enclosed *Industry White Paper – Integrated Approach to Modular Plant Licensing* is provided as further input to the NRC staff in this important area.

Nuclear plants made up of relatively small reactor modules represent an important and promising nuclear option for the future. Modular plants enable plant owners to add power to the grid and incur capital costs incrementally over a period of years according to market conditions and the pace of electrical demand growth. The enclosure presents an integrated approach to modular plant licensing that is based on issuance of separate Part 52 combined licenses for each module of a modular plant. Via this approach, four fundamental objectives are achieved that are central to the viability of modular nuclear plants:

- A plant consisting of multiple reactor modules (i.e., a modular plant) would be subject to a single set of licensing reviews and hearings by the NRC.
- Each module of a modular plant would be permitted to operate for the maximum period permitted by the Atomic Energy Act.
- A modular plant would be subject to a single annual (Part 171) fee by the NRC.
- A modular plant would be subject to a single Price-Anderson retrospective premium.

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Add: Amy Cabbage - Electronic

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In addition, the enclosure responds to the preliminary view in SECY-01-0207 that unconstructed modules of a modular plant would be subject to unconstrained design re-review by the NRC staff every five years during the term of the COL. While this proposal was based on a different licensing approach from that recommended in the enclosure, we feel it is important to make clear that such unconstrained design re-reviews are not necessary and would not be appropriate under any circumstances or licensing scenario. The NRC already has authority to impose backfits at any time to ensure adequate protection of the public health and safety or the common defense and security, and may at any time impose cost-justified backfits on non-certified designs in order to achieve a substantial increase in safety.

Moreover, periodic design re-reviews would take away the very certainty that a COL is intended to provide with respect to completion of an approved plant, and thus undermine the viability of the modular plant concept.

In our May 22 meeting, we briefly discussed three additional issues that were addressed in SECY-01-0207:

#### Decommissioning funding assurance

SECY-01-0207 summarizes the requirements of 10 CFR 50.75(e)(1), which lists acceptable methods of providing financial assurance for decommissioning. The SECY correctly identifies the approved methods (sinking fund, prepayment, corporate guarantee, surety bond, contractual obligation), and further states that "any combination of the foregoing methods" would also be acceptable. In the update to SECY-01-0207, this statement should be revised to more accurately reflect 10 CFR 50.75(e)(1), which states that a license may provide the necessary assurance through "any other mechanism, or combination of mechanisms, that provides... assurance of decommissioning funding equivalent" to the five options listed above.

The industry is exploring alternative methods for assuring adequate decommissioning funding for future plants that will not recover decommissioning costs through rates or a wires charge (e.g., merchant plants).

#### Timing of approval of new and spent fuel storage casks

SECY-01-0207 states that as part of a PBMR license application, an applicant would need to have approved fresh fuel and spent fuel casks. We understand that the NRC staff recognizes that this is not a regulatory requirement and intends to clarify its position in the update to SECY-01-0207.

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Testing requirements for COL applicants

We disagree with the NRC staff view that COL applicants should be subject to the design demonstration requirements established for design certification applicants. We understand that the Part 52 notice of proposed rulemaking will provide the vehicle for resolving this issue, and that it will not be addressed in the update to SECY-01-0207.

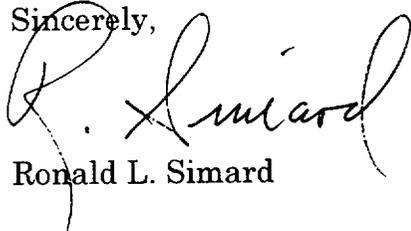
NRC antitrust review requirements

SECY-01-0207 identifies that the NRC is evaluating the ability of the NRC to except certain applicants for new nuclear generating facilities from the NRC's antitrust review requirements. Given the changes in the competitive electric market, FERC's expanded authority to regulate competition, and the broad authority of the traditional federal antitrust authorities, we continue to recommend that the NRC use its existing authority under Section 105c(7) of the Atomic Energy Act to seek approval from the Attorney General to except certain license applicants (e.g., merchant generating companies) from pre-licensing antitrust review.

The industry is separately pursuing legislative change to eliminate the Section 105c requirement for NRC to perform pre-licensing antitrust reviews.

If you have any questions about the approach we recommend in the enclosure for licensing modular plants or other matters related to the staff's update of SECY-01-0207, please give me a call at 202-739-8128, (or [rls@nei.org](mailto:rls@nei.org)), or you can contact Russ Bell at 202-739-8087 (or [rjb@nei.org](mailto:rjb@nei.org)).

Sincerely,



Ronald L. Simard

Enclosure

c: Ms. Amy E. Cabbage  
Document Control Desk

Enclosure  
NEI White Paper  
Integrated Approach to Modular Plant Licensing

1 Introduction

Nuclear plants made up of relatively smaller (100-300 MWe) reactor modules represent an important and promising nuclear option for the future. Modular plants enable plant owners to add power to the grid and incur capital costs incrementally over a period of years according to market conditions and the pace of electrical demand growth. Recognizing the potential advantages of the modular plant approach, legislation has been introduced in both houses of Congress to ensure that modular plants are not subject to excessive levels of liability under the Price-Anderson Act's secondary protection scheme. The changes being considered by Congress reflect the principle that financial-related requirements should not put new nuclear plants of modular design at a disadvantage relative to traditional nuclear plant designs.

This principle applies to regulatory as well as statutory requirements. The NRC's ongoing examination of the ability of the regulatory infrastructure to accommodate modular plants (via SECY-01-0207, the March 27 public workshop and planned follow-up Commission paper) is consistent with the parallel activities of Congress. We appreciate the opportunity to provide input to the NRC staff with respect to ensuring the appropriateness of NRC financial-related requirements and practices as applied to the licensing of modular plants.

2 Objectives for Modular Plant Licensing

An integrated approach to the licensing of multiple modules at a site should have the following objectives in order to eliminate undue regulatory barriers to new nuclear plants of modular design.

- A plant consisting of multiple reactor modules (i.e., a modular plant) should be subject to a single set of licensing reviews and hearings by the NRC.
- Each module of a modular plant should be permitted to operate for the maximum period permitted by the Atomic Energy Act.
- A modular plant should be subject to a single annual (Part 171) fee by the NRC.
- A modular plant should be subject to a single Price-Anderson retrospective premium.

While the issues involved in achieving these objectives are of an administrative or financial nature and do not concern safety, they are no less important in the sense that uneven or overly burdensome requirements may inappropriately penalize one

type of nuclear plant versus another or, worse, new nuclear plants in general. Overly burdensome requirements could potentially discourage the deployment of innovative nuclear technology for meeting future demand in the U.S. for safe, reliable, emission-free generating sources. The NRC has wide latitude under the Atomic Energy Act (AEA) for achieving the identified objectives for modular plant licensing. This paper describes an integrated approach for ensuring that modular plants will not face undue regulatory barriers.

### 3 Integrated Approach to Modular Plant Licensing

We agree with the conclusion in SECY-01-0207 that the NRC could issue individual combined licenses (COL) for each reactor module of a modular plant, or it could issue a single COL that covers all modules of a modular plant. With respect to achieving the identified objectives for modular plant licensing, we believe there are administrative and procedural advantages to obtaining an integrated set of separate modular COLs, one for each reactor module of a modular plant.

The industry envisions that modular plant licensing under Part 52 would include the following key features:

- The applicant would prepare a single FSAR and submit nearly identical COL applications for each module for which NRC approval is sought. The applications may or may not reference an ESP and a design certification, which could cover either a single module or the standard portion of a multi-module plant.
- Under the broad authority granted to it by the AEA for conducting licensing proceedings, the NRC would subject the integrated set of nearly identical COL applications for each module of a modular plant to a single set of licensing reviews and a single public hearing.
- Issuance of the set of modular COLs would authorize construction of each module of the modular plant. Consistent with 10 CFR 50.33(h), each modular COL application will identify, and each separate COL will approve, the latest anticipated date that each module will be completed. It is expected that one or more COL applications will identify plans to complete construction on their respective modules within the first few years after issuance of the modular COLs, while others will identify a schedule for completing modules over a longer period based on the licensee's demand projections for electricity. If market conditions or other factors delay the planned construction of one or modules, a license amendment would be required to extend the "completion by" date(s) specified in the modular COL(s). The NRC decision to extend the "completion by" date(s) in the COL(s) would be focused on the safety impact of the delay and would not involve reconsideration of the design and licensing bases of the module(s).

- Authorization to operate for each module under the COL will be granted when the NRC makes the required finding under 10 CFR 52.103(g) that all ITAAC have been satisfied. The forthcoming Part 52 notice of proposed rulemaking is expected to clarify that, for modular plants, separate 10 CFR 52.103(g) findings are required for each module.
- Under current requirements, the 40-year term of modular COLs would commence upon their issuance by the NRC. Legislation being considered in both houses of Congress, if enacted into law, would provide for the 40-year license term to begin when the NRC makes the required ITAAC finding under 10 CFR 52.103(g). We expect that the NRC would initiate a conforming change to Part 52, if and when the AEA is amended in this regard. With respect to individually licensed modules, the pending legislation would allow module-specific 40-year license terms to commence with the 10 CFR 52.103(g) finding on each module.

For clarity and administrative efficiency, individual modular COLs could be issued in two parts. One part would contain provisions that are typical of operating licenses issued under Part 50 and equally applicable to all modules of the modular plant. These provisions could include findings made in support of the licenses; reference to a single FSAR for all modules; specification of authorized activities, such as possession of special nuclear materials; incorporation of the technical specifications and other license conditions; identification of exemptions (if any) granted from NRC regulations; etc. Also common to all modules licensed under Part 52 is that each module is authorized to load fuel and operate following the 10 CFR 52.103(g) ITAAC finding for that module and that operational requirements would become applicable and the technical specifications would become effective at that time.<sup>1</sup>

A module-specific part of modular COLs would contain a reference to the part containing common provisions and information unique to each individual modular COL. This module-specific information would include the licensee's unique identifier and NRC docket number for each module, the completion-by date, and a provision that would identify the effective date of the COL for the module, together with a provision that identifies the expiration date of the COL for that module. As identified above, the expiration date for the modular COL may be tied to the required ITAAC finding under 10 CFR 52.103(g).

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<sup>1</sup> As with any COL, certain operational requirements will be in effect even before fuel load, including security/safeguards, radiation protection, etc. Clarifying the phased effectiveness of such operational requirements for plants licensed under Part 52 is beyond scope of this paper.

The above-described approach to modular plant licensing under Part 52 would achieve the four identified objectives for modular plant licensing and ensure that modular plants are not subject to undue regulatory barriers, as follows:

- Under the broad authority granted to it by the AEA for the conduct of licensing proceedings, the NRC would subject an integrated set of nearly identical COL applications for each module of a modular plant to a single set of licensing reviews and a single public hearing
- Legislation pending in Congress will allow module-specific 40-year license terms to commence with the 10 CFR 52.103(g) finding on each module. If this legislation is not enacted, the industry will consider requesting a Commission policy decision on the current authority of the NRC under Part 52 and the 1992 Energy Policy Act to provide for COLs to expire 40 years from the date of the 10 CFR 52.103(g) finding(s).

If this objective is not achieved via new legislation or existing NRC authority, the 40-year license term for all modules of a modular plant would commence upon issuance of the modular COLs. To enable all modules of a modular plant to operate until the end of their useful design life, it is expected that modular plant licensees would seek to renew the modular COLs pursuant to 10 CFR Part 54. Consistent with Part 54 and license renewal reviews to date, modular plant license renewal would focus on assuring the management of the effects of aging and maintenance of the current licensing basis. Further discussion of this scenario would be needed to ensure common understanding of the license renewal process as applied to modular plants.

- Based on the changes to Section 171.15 discussed in SECY-01-0207 and proposed in the NRC's FY2002 fee rulemaking (67 FR 14818), the NRC would assess its annual fees on a per license basis. If individual COLs are issued for each module of a modular plant, a further change to the NRC's annual fee structure will be necessary to provide for assessment of a single annual fee to a modular plant consisting of several separately licensed modules. To ensure fairness and equity in the assessment of annual fees, the NRC has sufficient statutory flexibility to further modify its fee structure and assess a single annual fee to a multi-module plant, even if modules are licensed separately.<sup>2</sup>
- Legislation is pending that would enable multiple module reactors to be subject to a single retrospective premium under the Price-Anderson Act. Upon renewal of the Act, we expect that the NRC would initiate a conforming change to the financial protection requirements of Section 140.11 to reflect the new modular plant provisions.

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<sup>2</sup> To ensure fairness and equity, it may be appropriate to establish a formula for partial assessment of annual NRC fees for partially completed modular plants.

#### 4 Design Approval for a Modular COL

The modular COL will embody NRC design approval for all modules proposed in the modular COL application, common systems, interfaces between the modules, interfaces with the site, etc. The modular COL application may or may not reference a design certification on a single module or on the standard portion of a multi-module plant. In either case, the NRC design approval embodied in the modular COL will be the result of thorough technical/safety review by the NRC, including opportunity for comment and hearing by the public.

The duration of the NRC design approval is coincident with the term of the modular COL. The modular plant licensee may begin construction and deploy individual modules at any time during the license term, in accordance with the module completion dates specified in the modular COL. As a practical matter, financial and business considerations are expected to dictate that construction of all modules be completed within 20 years of issuance of the modular COLs. Except as required in connection with design changes and license amendments, no further design reviews or approvals by NRC are necessary or required after issuance of the modular COLs. As noted previously, each modular COL will authorize module operation following the 10 CFR 52.103(g) finding on each module.

In discussing the implications of obtaining a single license for a multi-module plant versus separate licenses for each module, the NRC staff suggests in SECY-01-0207 that under the single license alternative, NRC design approval would exist for only five years. Modules on which construction had not begun within five years of COL issuance would, according to the staff's preliminary position, be subject to design re-review unconstrained by the Backfit Rule, 10 CFR 50.109. While this proposal was based on a different licensing approach from that recommended in the enclosure, we feel it is important to make clear that under no circumstances would periodic design re-reviews by NRC be necessary or appropriate during the term of any COL. In particular, such unconstrained design re-reviews would not be necessary or appropriate under any modular plant licensing scenario, including obtaining separate (complete) licenses for each module or a single license for all modules. The key reasons that modular design re-reviews would be unnecessary and inappropriate are summarized below.

- First and foremost, periodic design re-reviews are unnecessary for assuring safety or the common defense and security, given the provisions of the Backfit Rule. 10 CFR 50.109 already enables the NRC to backfit a licensed design *at any time* in order to ensure adequate protection of public health and safety or the common defense and security, or obtain compliance with applicable

requirements.<sup>3</sup> Additionally, Section 50.109 allows the NRC *at any time* to impose cost-justified backfits intended to achieve a substantial increase in safety. Thus, the five-year design reviews are not necessary to assure public health and safety or the common defense and security.

Indeed, the only backfits that the envisioned five-year design re-reviews would allow that the NRC would not already have authority to impose under 10 CFR 50.109 would be those that do not result in a substantial increase in safety or are not cost-justified. Such a proposal serves no valid health and safety/common defense purpose and should not be adopted.

10 CFR 50.109 will apply to both constructed and unconstructed modules. Thus, to the extent that backfits are justified and imposed by the NRC, they would be applied to all existing modules and incorporated into all yet-to-be constructed modules of the modular plant.

- Part 52 expressly provides for issuance of COLs that resolve all safety and environmental issues associated with the design, site, and intended operation of the plant, and further, that the term of a COL shall be 40 years. These provisions reflect the Commission's stated intent "to achieve the early resolution of licensing issues, thereby enhancing the safety and reliability of nuclear power plants, and reducing the complexity and regulatory uncertainty of the licensing process" (53 FR 32060). The envisioned five-year design re-reviews would be contrary to both the specific provisions of Part 52 and the Commission's clearly stated intent for the new licensing process.

Furthermore, existing operating licenses, including those for each unit of multi-unit plants, are routinely effective for 40 years without further design reviews, and there is no precedent or basis for altering the current well established practice regardless of whether an applicant elects to apply for a single COL for multiple modules or a separate (complete) COL for each module.

- It is possible, even likely, that construction of some of the modules approved in a COL would not be begun within five years of issuance. Standardization was a significant objective of the Commission in issuing Part 52, and unconstrained design re-reviews of unconstructed modules after five years would severely undermine the safety benefits that standardization via Part 52 was intended to achieve.

Periodic design re-reviews and unconstrained backfits of the unconstructed modules to the latest standards and NRC requirements would lead to variation among the modules of a modular plant. Such variation would be contrary to

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<sup>3</sup> If the COL references a design certification, backfits affecting the design certification scope of the plant would be subject to the backfit criteria of 10 CFR 52.63.

safe and efficient operations. Moreover, differences in the design and licensing bases would arise among modules, an untenable situation considering the fundamental intent to operate and maintain the modules identically and to maintain a single FSAR.

- Currently the NRC is engaged in rulemaking to “reduce the regulatory burden for future applicants and improve the effectiveness of 10 CFR Part 52.” The concept of periodic modular design re-reviews is inconsistent with this objective because it would impose significant and unnecessary additional complexities and burden on both the licensee and the NRC.

The flexibility to deploy all modules of a modular plant simultaneously, in quick succession, or over a period of several years is fundamental to the modular plant concept. Periodic design re-reviews would undermine the modular plant concept by removing licensing certainty, which is both central to the business case to proceed with a modular plant project and a central goal of Part 52. The NRC staff should reconsider its preliminary position in SECY-01-0207 because, for the reasons identified above, burdensome modular design re-reviews are not necessary for safety under any licensing scenario and would be contrary to the intent of Part 52.

## 5 Conclusions

In sum, the NRC has the authority to issue separate COLs for each module of a modular plant, or a single COL covering multiple modules. Based on the potential for administrative efficiencies, it is expected that modular plant applicants will seek separate COLs for each module of a modular plant. As described above, the four key objectives for modular plant licensing would be achieved by:

- NRC issuance of an set of nearly identical COLs for each module of a modular plant following a single integrated technical/safety review and public hearing
- Following enactment of enabling legislation now pending in Congress, conforming changes to NRC requirements to allow commencement of module-specific 40-year license terms upon the NRC’s 10 CFR 52.103(g) finding for each module
- Use of existing NRC authority to clarify requirements for assessing annual fees such that multi-module plants will be assessed on a per plant basis
- Assessment of a single Price-Anderson retroactive premium for qualifying modular plants, as provided for by legislation pending in Congress

Subject to applicable backfit provisions (10 CFR 50.109 or 10 CFR 52.63), the duration of NRC design approval would coincide with the term of the modular COLs. Financial

and business considerations are expected to dictate that construction of all modules be completed within 20 years of issuance of the modular COLs.

The outlined approach to modular plant licensing would fully comply with the AEA and NRC regulations and ensure that modular plants are not subject to undue regulatory barriers.

In addition to modular plants, key elements of the licensing approach described in this paper would apply to new nuclear plants consisting of multiple, traditionally sized units. In particular, licensing a two unit AP1000 or ABWR would be expected to involve a single proceeding/single FSAR, separate nearly identical applications and licenses for each unit, and separate license terms ending 40 years from the date of the NRC's 10 CFR 103(g) findings.